

Distribution Characteristics of Black-faced Spoonbill *Platalea minor* in Western Coast of South Korea

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ABSTRACT : The study was conducted to get the basic information for proper protection and management of black-faced spoonbill and their habitats in western coast of South Korea. The species was observed in 8 sites of western coast of South Korea in spring 2000. We confirmed breeding of this species at least 4 pairs in Seokdo island. This island is considered likely to be an important breeding site together with Yudo island, Hambakdo island and Yokdo island. Also, we observed breeding of herring gull in Seokdo island and small island nearby Boleumdo island for the first time in South Korea. Chilsando island, Cheonsuman bay and Gyeokyeolbiyeoldo island were considered as stopovers located on the Korean Peninsula route. The other sites were considered as summering sites of the black-faced spoonbill. Especially the birds were constantly observed from breeding season to post-breeding season in Seonduri and Yeochari of Ganghwado island. We have counted maximum 88 individuals gathered at Gaksiyeo in Seonduri and Yeochari on September 3, 2000. The species seemed to gather at these sites after breeding for migration to wintering ground in September. We also surveyed changes of the number of individuals as time of the ebb and flow on September 3 and 6, 2000, their time budgets were affected by the ebb and flow in these sites.

Key words: Black-faced spoonbill, Distribution, Korean Peninsula, *Platalea minor*, Uninhabited islands

INTRODUCTION

The black-faced spoonbill is a globally threatened species (del Hoyo *et al.* 1992, Chong and Pak 1999), was classified as endangered by the IUCN (Groombridge 1993, IUCN 1997) and listed as critical in BirdLife International's Birds to Watch 2 (Collar *et al.* 1994). The species is considered to be facing an extremely high risk of extinction in the wild in the immediate future, due to the potential for drastic population decreases caused by reductions in the species range or the quality of its habitat.

The species has an estimated population of about 600 birds found solely in eastern Asia. Only four breeding sites are known on offshore islands off the western coast of the Korean Peninsula. Migration routes are poorly known with few records in South Korea, Japan, and China. Three major wintering sites are in Taiwan, Hong Kong, and Vietnam, with minor sites in China, South Korea, and Japan (BirdLife Asia Council 1995).

The birds are presently known to breed only on the Korean Peninsula and in Northeast China, and winter on the Janggang River of China, Taiwan, Hong Kong, Kyushu of Japan, Jeju island of South Korea (Chong *et al.* 1996, Kim *et al.* 1998). The historic range of spoonbill on the Korean Peninsula was known as Duman River of Hamgyeongbuk Province, Pyeonganam

Province, Pyeonganbuk Province, Gyunggi Province, Jeollanam Province, Jeollabuk Province, Gyeongsangnam Province, and Jeju island (Yamashina 1941, Won 1963, Won 1981, Won 1994, Kim *et al.* 1998).

The habitats of black-faced spoonbill face a variety of threats in South Korea. The main threats are probably degradation and loss of habitat by development pressures (Won 1992). The influences of pollution, competition for foods, and other threats on the survival of this species may also be important but have not been evaluated due to the lack of information and data.

For the conservation of black-faced spoonbill, the current status and distribution should be clearly investigated, and habitat should be protected and soundly managed. This study was conducted to investigate the distribution and behavior of black-faced spoonbills by tidal level for the basic data of proper protection and management of the species and their habitats in western coast of South Korea.

STUDY AREA AND METHODS

For the basic information on the black-faced spoonbill, the papers, books, journals, and newspapers were reviewed to

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investigate the potential distribution of the birds in South Korea, and bird watchers, ornithologists, nature reserve staff, and fisherman were interviewed. After the gaining of basic information on distribution of black-faced spoonbills, we have selected 20 islands and areas in western coast of South Korea as the study sites for the distribution survey of the species (Fig. 1). Most of them were uninhabited islands.

Distribution survey was conducted from April 30 to September 20, 2000. By the boat we could approach to the islands, and counted the number of individuals (including adults and juveniles) of black-faced spoonbills on the island.

In September, when black-faced spoonbills were gathered in Seonduri of Ganghwado island, Gyunggi Province, we have surveyed the number of individuals, behaviors (resting, feeding, movement, and direction of movement) according to the ebb and flow of the tide.

RESULTS AND DISCUSSION

According to the records in South Korea, black-faced spoonbills bred at Wido island in 1916 and 1917 (Kuroda 1918), and a pair at Chilsando island in 1991 (BirdLife Aisa Council 1995). Twenty-one individuals including 14 juveniles were observed at Yudo islands in Han river estuary in July, 1994 and breeding pairs were estimated 5-10 pairs (Won 1994).

In Seokdo island, breeding of these species had first observed by a photographer in June, 1995 (Ministry of Environment 1999). Breeding of 10 pairs in Seokdo island was reported to Cultural Properties Administration in June, 1999 (No 1999). And also we have confirmed 22 adults including immatures and 12 juveniles of the birds in June, 2000 (Table 1 and Fig. 1). Black-faced spoonbills lay 4-6 eggs (Won 1981) but Chong *et al.* (1997) reported that there was no nest over three eggs among 5 nests. We confirmed 12 juveniles in Seokdo island, so we estimated at least 4 pairs bred in the island.

Based on the satellite tracking data, Chong and Pak found 24

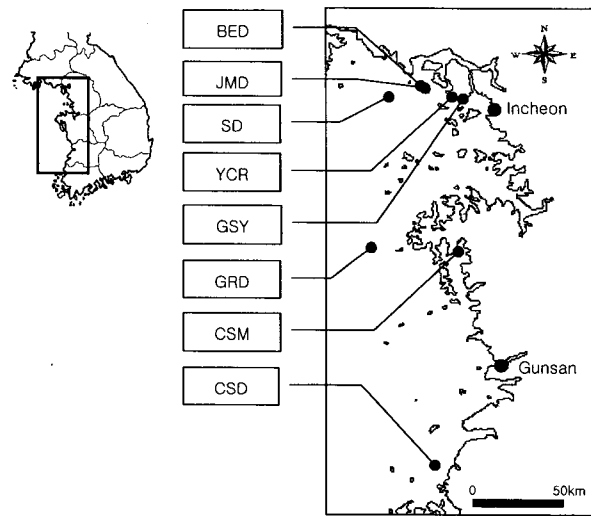


Fig. 1. Observed sites of black-faced spoonbills on western coast of South Korea in spring, 2000 (BED; small island near by Boleumdo island, JMD; Jumundo island, SD; Seokdo island, YCR; Yeochari, GSY; Gaksiyeo in Seonduri, GRD; Gyeokryeolbiyeoldo island, CSM; Cheonsuman bay, CSD; Chilsando island).

nests in Hambakdo island in North Korea around the DMZ of western coast of Korean Peninsula and also found good rocky habitats for this birds to breed in Yokdo island (BirdLife International Asia Council 1999). In 2000, broadcasting document team have observed the breeding of black-faced spoonbill in Wido island, where was reported the breeding of the birds in 1994. Seokdo island, Yudo island, Hambakdo island, and Yokdo island are located near the DMZ, where is difficult to approach for common people, this areas are considered likely to be an important breeding and summering site of them.

Over 200 pairs of black-tailed gull (*Larus crassirostris*), 50 pairs of Temimncks comorant (*Phalacrocorax capillatus*) and 6 adults and 5 juveniles of herring gull (*Larus argentatus*) were also bred in Seokdo island. 6 individuals of white-rumped swift

Table 1. Observed number of black-faced spoonbills on western coast of South Korea in spring, 2000

Date	Location	No. of individuals	Remark
16 May 2000	Chilsando island, Jeollanam Province	1	Immature
17 May 2000	Cheonsuman bay, Chungcheongnam Province	3	Adult 2 immature 1
18 May 2000	Gyeokryeolbiyeoldo island, Chungcheongnam Province	3	Adult 2 immature 1
1 June 2000	small island near by Boleumdo island, Gyunggi Province	4	Include immature
2 June 2000	Jumundo island, Gyunggi Province	11	Include immature
2 June 2000	Gaksiyeo in Seonduri, Gyunggi Province	22	Include immature
2 June 2000	Farmland in Seonduri, Gyunggi Province	17	Include immature, feed on rice paddy
17 June 2000	Seokdo island, Gyunggi Province	34	Adults and immatures 22, juveniles 12 Breeding at least 4 pairs
22 June 2000	Yeochari, Gyunggi Province	4	Adult 1 immatures 3
Total		99 individuals	

Table 2. Observed bird species on Seokdo island Gyunggi Province in 17 June 2000

Species	No. of individuals	Remark
<i>Phalacrocorax capillatus</i>	150+	breeding (over 50 pairs)
<i>Haematopus ostralegus</i>	1	
<i>Larus crassirostris</i>	600+	beeding (over 200 pairs)
<i>Larus argentatus</i>	11	breeding (include 5 juveniles)
<i>Apus pacificus</i>	6	probably breeding

(*Apus pacificus*) and 1 individuals of Eurasian oystercatcher (*Haematopus ostralegus*) were also observed in that island (Table 2). We observed the 2 adults and 3 eggs of herring gull in the small island near by Boleumdo island where the black-faced spoonbills could be bred. The breeding of herring gulls in Seokdo island and small island nearby Boleumdo island are first breeding records of that birds in South Korea. Also herring gull was known as an important natural enemy of the nesting spoonbills (Chung *et al.* 1996). For that reason, it is necessary to monitor the breeding of herring gulls in the islands where were known as black-faced spoonbills breeding sites.

We also observed black-faced spoonbills at 7 sites of western coast of South Korea through this study (Table 1 and Fig. 1). Among them, Chilsando island in Jeollanam Province, Cheonsuman bay and Gyeokyeolbiyeoldo island in Chungcheongnam Province had no breeding evidences of this species, so these sites were considered as stopover on migration route of the birds. Chong *et al.* (1997) have discussed on the two migration routes of the birds. One is Chinese continental coast route and the other is the Korean peninsula route. Chilsando island, Gyeokyeolbiyeoldo island and Cheonsuman bay are located on the Korean Peninsula route. Also this spring migration route is interpreted as another migration route compared with the results of satellite tracking in spring 1998 (BirdLife International Asia Council 1999).

The other sites are small island nearby Boleumdo island, Jumundo island, Seonduri and Yeochari of Ganghwado island and Seokdo island in Gyunggi Province. Especially, the birds were constantly observed from breeding season to post-breeding season in Seonduri and Yeochari of Ganghwado island (Table 1 and Fig. 1). In September 1989 and 1991, maximum 60 and 20 individuals were observed in Yeochari of Ganghwado island, respectively (Won 1990, Won *et al.* 1991). Also there was a record of 20 non-breeding flocks of black-faced spoonbills at Seonduri, mudflats of southern part of Ganghwado island on July, 1995 (BirdLife Aisa Council 1995). And these species gathered maximum flock of 39 on fish pond in Yeochari from mid-August to late in September, 1998 and after September they were likely to moved to southern part of the Korean Peninsula along the western coast (Ministry of Environment 1999). We

Table 3. Maximum number of observed black-faced spoonbills in post breeding season at Gaksiyeo, Seonduri and Yeochari of Ganghwado island, Gyunggi Province

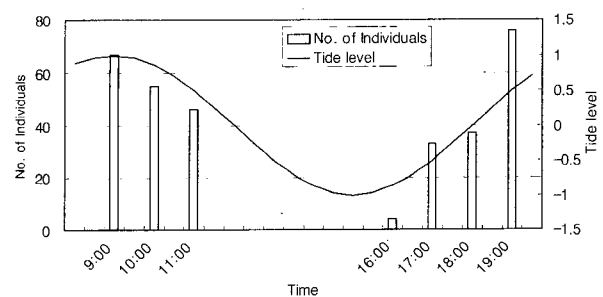
Location\Date	3 Sep. 2000	6 Sep. 2000
	9:30 AM	10:00 AM
Gaksiyeo, Seonduri, Ganghwado island	71	65
Yeochari, Ganghwado island	17	16
Total	88	81

have counted black-faced spoonbills gathered at Gaksiyeo (small rocky island) in Seonduri and abandoned fishpond in Yeochari of Ganghwado island, Gyunggi Province at same time. Maximum number of individuals were 88 and 81 individuals on September 3 and 6, 2000, respectively (Table 3). As the result of this study and former records, black-faced spoonbills have gathered in Yeochari and Seonduri of Ganghwa island after breeding season for migration to wintering ground in September.

Abandoned fish pond in Yeochari seems to be easily affected by human disturbance i.e. fishing activity etc. But Gaksiyeo in Seonduri is located in the middle of the wide mudflat, where is difficult to approach. There are large area of rice paddy near the mudflat as additional foraging site for the birds. Therefore, Gaksiyeo is considered as good roosting site for black-faced spoonbills.

We surveyed the changes of number of individuals as time of the ebb and flow on September 3 and 6, 2000, respectively at Gaksiyeo, Seonduri of Ganghwa island, Gyunggi Province (Figs. 2 and 3). We used the data on the time of the ebb and flow from National Oceanographic Research Institute.

This results show that the birds moved to foraging site when ebb tide started and all of them leaved the island when the tide level was near intermediate. When the flow tide started, they return to the island. In Gaksiyeo, the birds spent most of the times by preening and roosting. They seemed to have time for foraging when the low tide leaving from there. At this time, black-faced spoonbills were considered that they preferred ebb tide to

**Fig. 2.** Changes in number of individuals of roosting black-faced spoonbill compared with tide level at Gaksiyeo, Seonduri of Ganghwado island, Gyunggi Province in 3 Sep. 2000 (In tide level, 1 and -1 represent the highest and lowest tide level, respectively).

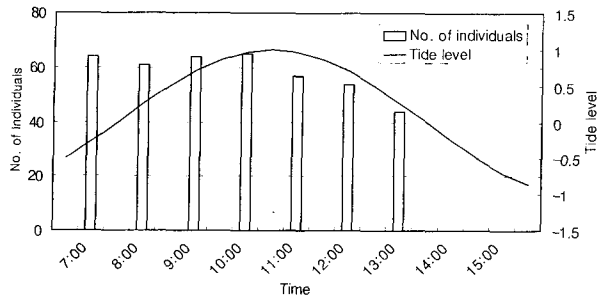


Fig. 3. Changes in number of individuals of roosting black-faced spoonbill compared with tide level at Gaksiyeo, Seonduri of Ganghwa Island, Gyunggi Province in 6 Sep. 2000 (In tide level, 1 and -1 represent the highest and lowest tide level, respectively).

flow tide for foraging at proper shallow water (10-25cm) and their time budgets were affected by the ebb and flow. When ebb tide started, we observed that most of black-faced spoonbills moved in the direction of the mudflat in Yeochari. This result seemed to be related that mudflat in Yeochari is more abundant distribution of benthic animals, which are potential foods of the waterbirds, than other mudflats around the Ganghwa Island area (Lee et al. 1999).

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LITERATURE CITED

- BirdLife Asia Council. 1995. Action Plan for the black-faced spoonbill *Platalea minor*. Wild Bird Society of Republic of China. Taipei, Taiwan. 75 p.
- BirdLife International Asia Council. 1999. Discovery of the breeding and migration routes of black-faced spoonbills *Platalea minor*. Proceedings of international workshop on the conservation of black-faced spoonbill. BirdLife International Asia Council Taipei. pp. 30-42.
- Chong, J. R. and U. I. Pak 1999. The breeding sites and distribution of black-faced spoonbills *Platalea minor* in the Democratic Peoples Republic of Korea (DPRK). Proceedings of conservation and research of black-faced spoonbills and their habitats. Wild Bird Society of Japan, Tokyo. pp. 5-9.
- Chong, J. R., U. I. Pak, C. Y. Rim, and T. S. Kim, 1996. Breeding biology of black-faced spoonbill *Platalea minor*. Strix 14: 1-10.
- Chong, J. R., U. I. Pak, C. Y. Rim and T. S. Kim. 1997. Migration route and wintering ground of black-faced spoonbill *Platalea minor*. Bulletin of Korea University in Japan 15: 68-80.
- Collar, N. J., M. J. Crosby, and A. J. Stattersfield. 1994. Bird to Watch 2; The world list of threatened birds. BirdLife International, Cambridge. 407 p.
- del Hoyo, J., A. Elliott and J. Sargatal. 1992. Handbook of the birds of the world. Vol. 1. Lynx Editions, Barcelona. 696 p.
- Groombirdge, B. 1993. IUCN red list of threatened animals. IUCN Gland, Switzerland and Cambridge.
- IUCN. 1997. 1996 IUCN red list of threatened animals. IUCN Gland, Switzerland and Cambridge.
- Kim, W. B., H. S. Oh and H. S. Park. 1998. Population status and protection of the black-faced spoonbill on Cheju Island, Korea. Kor. J. Orn. 5: 27-33.
- Kuroda, N. 1918. Notes on Korean and Manchurian birds. Annot. Zool. Jap., 9(4): 495-573.
- Lee, S. W., Y. S. Kwon, J. G. Je & J. C. Yoo. 1999. Benthic Animals of Kanghwa Island and Gut Analysis of Some Waterbirds. Kor. J. Orn. 6(2): 71-86.
- Ministry of Environment. 1999. Natural environmental survey of uninhabited island in Korea (Ganghwa and Ongjin-gun of Incheon Metropolitan city). 189 p.
- No, Y. D. 1999. Report on the breeding sites of black-faced spoonbills, Natural Monument No. 205. Cultural Properties Administration. Daejeon. 7 p.
- Won, H. G. 1963. Bird of Korea Vol. 1. Academy of Science Press. Pyoungyang. 290 p.
- Won, P. O. 1981. Illustrated flora & fauna of Korea. Vol. 25 Avifauna. Department of Education, Republic of Korea. Seoul. 1126 p.
- Won, P. O. 1990. Birds. In Rare and Endangered Animals and Botany in Korea. KACN Research Report 10. Seoul. 209 p.
- Won, P. O. 1992. Animal Treasures (Natural Monuments) in Korea. Daewon Publ. Co. Seoul. 311 p.
- Won, P. O. 1994. Recent discovery of black-faced spoonbill breeding in South Korea. Asian Wetland News 7(2): 24.
- Won, P. O., J. Y. Park, U. Y. Kim, D. P. Lee, H. S. Lee, G. S. Lee, C. Swennen, T. Mundkur, H. C. Kim and H. S. Park. 1991. Waterbird survey on the Wintering (or Staging) and Breeding sites in Korea. Institute of Ornithology. Kyunghee Univ., Seoul. 87 p.
- Yamashina, Y. 1941. Birds of Japan and their ecology. Vol. 2. Tokyo. 1080 p.

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